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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
YU, MELANIE J	

ART UNIT	PAPER NUMBER
1641	

DATE MAILED: 03/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/750,301	SU ET AL.	
	Examiner	Art Unit	
	Melanie Yu	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,33 and 34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,33 and 34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's amendment filed 12 December 2005 has been entered. Claims 1, 12 and 33 are currently amended. Claims 13-32 and 35-40 are canceled. Claims 1-12 and 33-34 are currently pending in this application.

Withdrawn Rejection

2. Previous rejections under 35 USC 112, second paragraph have been withdrawn.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-5, 7-12, 33 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Schultz et al. (US 6,180,415).

Regarding claims 1 and 33, Schultz et al. teach a solid gel matrix comprising a combination of a gel suitable for separation of biomolecules within the gel by electrophoresis (col. 6, line 65-col. 7, line 3; col. 30, lines 58-66) and one or more SERS-enhancing nanoparticles (col. 10, lines 14-26; col. 14, lines 21-43; col. 14, lines 21-43) contained in the gel (col. 30, lines 58-66) the SERS-enhancing nanoparticles (PRPs and PREs are nanoparticles, col. 8, lines 13-36) having an attached probe that binds specifically to an analyze (col. 23, lines 40-48 and 54-61); a sample containing at least one analyte (col. 5, lines 59-42 and lines 60-67); and an optical detection system suitable for detecting SERS signals from the nanoparticles (col. 10, lines 14-26; col. 2, lines 56-67).

With respect to claims 2 and 5, Schultz et al. teach the gel matrix comprising a plurality of nanoparticles to provide a plurality of unique optical signatures (nanoparticles are in the gel

matrix and properties of nanoparticles are described at col. 3, lines 28-36; col. 5, lines 39-42; col. 9, lines 18-47). Shultz et al. also teach the nanoparticles providing a unique SERS-signal that is correlated with the binding specificity of the probe of the nanoparticles (col. 5, lines 25-42; col. 14, lines 41-43; col. 14, lines 21-43).

Regarding claims 3 and 4, Shultz et al. teach the SERS-enhancing nanoparticles comprising one or more Raman active tags of fluorescent dyes and nucleic acids (col. 3, lines 42-48) and at least one of the nanoparticles having a net charge (col. 30, lines 55-57).

With respect to claims 7-12, Shultz et al. teach nanoparticles being composite organic-inorganic nanoparticles comprising a core and a surface, wherein the core comprises a metallic colloid comprising a first metal and a Raman-active organic compound (col. 24, lines 44-50; col. 23, lines 35-48). Shultz et al. teach the COINs further comprising a second metal different from the first metal forming a layer over overlying the surface of the nanoparticles (silver shell and gold core, col. 23, lines 35-39) and further comprising an organic layer overlying the metal layer, which organic layer comprises a polynucleotide probe (col. 23, lines 40-48 and 54-61; col. 5, lines 60-67). Schultz et al. further teach at least some of the nanoparticles further comprising a fluorescent label that contributes to the optical signature (col. 23, lines 40-48).

Regarding claim 34, Shultz et al. teach a computer comprising an algorithm for analysis of the SERS signals obtained from the sample (col. 15, line 66-col. 16, line 4).

Claim Rejections - 35 USC § 103

1. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shultz et al. (US 6,180,415) in view of Mirkin et al. (US 2003/0211488).

Shultz et al., as applied to claim 1, teach a solid gel matrix comprising a nanoparticles with one or more Raman-active tags, but fail to teach the Raman-active tag comprising adenine.

Mirkin et al. teach a Raman-active tag being an analog of adenine, poly-adenine (par. 181), in order to utilizing a spectroscopic fingerprint in protein-protein screening.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the solid gel matrix of Shultz et al., a nanoparticles comprising a Raman-active tag of an analog of adenine as taught by Mirkin et al., in order to provide increased sensitivity and specificity of detection of analyte.

Response to Arguments

2. Applicant's arguments filed 12 December 2005 regarding rejections of claims 1-5, 7-12, 33 and 34 under 35 USC 102(b) and claim 6 under 35 USC 103(a) have been fully considered but they are not persuasive.

Regarding the rejection of claim 1 under 35 USC 102(b), applicant argues that Schultz fails to teach or discuss any properties of a gel anywhere in the reference, so it is unclear whether the gel of Schultz is a "gel suitable for separation of biomolecules within the gel by electrophoresis". However, in response to applicant's argument, claim 1 requires a gel that is *suitable* for separation of biomolecules within the gel and *does not* require biomolecules within the gel. Schultz describes an agarose or acrylamide gel at column 30, lines 58-67, which separates nanoparticles (PRPs) bound to a biomolecule from PRPs that are unbound (conjugated PRPs are separated from free PRPs in a gel with a method of electrophoresis, col. 30, lines 63-66; furthermore bound PRPs have surface localized biomolecules, col. 30, lines 51-53) using electrophoresis, and would therefore be suitable for separation of biomolecules within the gel by

electrophoresis. Furthermore, since the bound nanoparticles in the agarose or acrylamide gel of Schultz have surface localized biomolecules and the bound nanoparticles are separated in the gel by electrophoresis, the gel of Schultz separates biomolecules within the gel by electrophoresis.

Applicant further argues that Schultz teaches particles that are on a particle coated silver film that is not contained within a gel and the separation of PRPs in a gel taught at column 30, are not SERS-enhancing nanoparticles as required by the claims. Applicant argues that Schultz fails to teach one or more SERS-enhancing nanoparticles contained in a gel. However, in response to applicant's arguments, it is noted that at column 14, lines 21-43, Schultz teaches that "SERS *traditionally* exploits the localized plasmon resonance in roughened or particle evaporated silver films to enhance the Raman scattering of various materials", but "in accordance with the present invention (SERS) is confined solely to PREs", wherein PRPs are a type of PREs (col. 4, lines 46-57 and 62-67). Therefore, the PRPs described in Schultz are SERS enhancing nanoparticles, wherein measuring changes in the PRE resonant Raman spectrum can be used to detect binding in the local environment of the Raman molecule (col. 14, lines 35-43). Furthermore, although the passage describing PRPs within an electrophoresis gel is described in the reference *20 columns after* the disclosure of SERS-enhancing nanoparticles, properties of the nanoparticles do not need to be disclosed in the same portion of the reference as the nanoparticles in an electrophoretic gel because at least one embodiment taught by Schultz anticipates the claims (col. 30, lines 58-66) and all other references disclose properties or further embodiments of the instant claims. Furthermore, the claim requires only that the one or more nanoparticles must be SERS-enhancing nanoparticles in the solid gel. Since Schultz teaches that PRPs have SERS-enhancing nanoparticles properties at column 14 and that PRPs may be

contained in a gel suitable for separation of biomolecules by electrophoresis at column 30, the reference of Schultz discloses that SERS-enhancing nanoparticles are contained within in the gel.

Applicant argues that Schultz does not teach the elements of the invention "arranged as required by the claim". This argument is not persuasive because the instant claims are directed to:

- A gel capable of separation of biomolecules within the gel by electrophoresis
- One or more SERS enhancing nanoparticles contained in the gel.

Such a gel is taught in its entirety by Schultz. Schultz teaches:

- A gel containing nanoparticles (PRPs, col. 30, lines 58-66)
- These particles are SERS-enhancing nanoparticles (PRPs are SERS-enhancing, col. 14, lines 30-43; PRPs are nanoparticles, col. 8, lines 25-27).

Clearly, the particles in the gel are SERS-enhancing nanoparticles. Therefore, Schultz clearly discloses the claimed invention. The fact that Schultz describes details of different embodiments does not diminish its teachings of the claimed invention. The arguments that the claimed elements are randomly located in the Schultz reference is not persuasive because at least one embodiment taught by Schultz anticipates the claim (col. 30, lines 58-66).

Applicant's arguments presented against the rejection of claim 6 35 USC 103a have been addressed since all arguments presented against the rejections over Schultz under 35 USC 102b have been addressed.

Conclusion

No claims are allowed.

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie Yu whose telephone number is (571) 272-2933. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Melanie Yu
Patent Examiner
Art Unit 1641

BAO-THUY L. NGUYEN
PRIMARY EXAMINER
3/10/06